



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,836	05/26/2006	Christian Lennartz	290824US	7081
22850	7590	11/16/2009		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
WILSON, MICHAEL H				
ART UNIT		PAPER NUMBER		
1794				
NOTIFICATION DATE		DELIVERY MODE		
11/16/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

Office Action Summary

Application No.

10/580,836

Applicant(s)

LENNARTZ ET AL.

Examiner

MICHAEL WILSON

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2009 and 25 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Individual Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action is in response to Applicant's amendment filed 31 July 2009 and 25 August 2009, which amends claims 1-3, 9, 11, and 12 and adds new claims 13-15.

Claims 1-15 are pending.

2. The rejection of under 35 U.S.C. 112, second paragraph of claims 2, 9, 11, and 12, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is overcome due to applicant's amending of the claims in the reply filed 31 July, 2009.

3. The rejection(s) under 35 U.S.C. 103(a) of claims 1-12 as being unpatentable over Rubner et al. (US 6,548,836 B1) in view of Che et al. (Solid-state emission of dicyanoplatinum(II) and -palladium(II) complexes of substituted 2,2'-bipyridines and 1,10-phenanthroline and x-ray crystal structures of isomorphous $M(bpy)(CN)_2$ (bpy= 2,2'-bipyridine; $M = Pt, Pd$) is overcome due to applicant's amending of the claims in the reply filed 31 July, 2009.

4. The filing date of Pawlowski et al. (Synthesis, structure, optical properties and theoretical studies of $Pt(P-P)(CN)_2$ with $P-P = 1,2$ -bis(diphenylphosphanyl)benzene and 2,2'-bis(diphenylphosphanyl)-1,1'-binaphthyl – luminescence from metal-to-ligand charge transfer and intraligand states.) lies between the filing date and the foreign priority date of the present application. Under MPEP 706.02(b), rejections based on 35 U.S.C. 102(e) can be overcome by perfecting the filing date of the priority document.

Applicant's submission of certified priority document on 26 May 2006 and its English language translation on 25 August 2009 results in the perfection of the foreign priority filing date. Therefore, Pawlowski et al. is no longer properly applicable as prior art against present claims 1-15.

5. The rejection(s) under 35 U.S.C. 103(a) of claims 1-12 as being unpatentable over Rubner et al. (US 6,548,836 B1) in view of Pawlowski et al. (Synthesis, structure, optical properties and theoretical studies of $\text{Pt}(\text{P-P})(\text{CN})_2$ with P-P = 1,2-bis(diphenylphosphanyl)benzene and 2,2'-bis(diphenylphosphanyl)-1,1'-binaphthyl – luminescence from metal-to-ligand charge transfer and intraligand states.) is overcome due to applicant's perfecting of foreign priority in the reply filed 25 August, 2009.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 4-6, 8, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Song et al. (Synthesis and luminescent study of diphosphine-Pt-diacetylide complexes for OLED.). Note this article was first published on-line 14 October 2003.

Regarding claims 1, 2, 4-6, 8, and 13, Song et al disclose an organic light-emitting device (OLED) comprising a light-emitting layer with a complex of instant

formula (I) (first full paragraph, page 193, first column). The reference discloses the complex of instant formula (I) wherein R3 to R6 are phenyl, X is naphthalenediyl group which is linked in the 4 and 5 positions to a phosphorous atom, and R1 and R2 are acetylide ligands (figure 1, page 192).

Regarding claim 3, modified Rubner et al. disclose all the claim limitations as set forth above. Additionally while the reference does not disclose a complex of instant formulae (II) or (III) the claim does not limit the platinum(II) complex to a complex of instant formulae (II) or (III). Therefore the claim limitations are met for the reasons set forth above.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1, 7, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubner et al. (US 6,548,836 B1) in view of Song et al. (Synthesis and luminescent study of diphosphine-Pt-diacetylide complexes for OLED.).

Regarding claims 1, 7, and 9-12, Rubner et al. disclose a solid state light-emitting device (OLED) comprising a light-emitting layer between two electrodes (column 3, lines 43-46). The reference discloses the light-emitting layer comprises a metal complex (column 3, line 66 to column 4, line 4, and lines 27-35). The reference also discloses that the metal complex may be a platinum complex and have polypyridine ligands such as phenanthroline (column 8 lines 33-42). The light-emitting layer may consist of metal complex (column 6, lines 5-22) or contain additives (column 5 lines 49-63). The disclosed device can be part of a display device such as a flat-panel display, computer screen or other item that requires illumination (column 1, lines 11-14). However, the reference does not explicitly disclose a complex of instant formulae (I) as the light-emitting complex.

Song et al. teach a complex of instant formula (I) for the light-emitting layer of an organic light-emitting device (OLED) (first full paragraph, page 193, first column). The reference teaches the complex of instant formula (I) wherein R3 to R6 are phenyl, X is naphthalenediyl group which is linked in the 4 and 5 positions to a phosphorous atom, and R1 and R2 are acetylide ligands (figure 1, page 192).

It would be obvious to one of ordinary skill in the art at the time of the invention to use the platinum(II) complex of Song et al. in the device of Rubner et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given

that Song et al. teach the complex as light-emitting material in the light emitting layer of an OLED and Rubner et al. disclose platinum(II) complexes as suitable. Case law holds that the selection of a known material based on its suitability for its intended use supports prima facie obviousness, *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

11. Claims 1-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubner et al. (US 6,548,836 B1) in view of Kuimova et al. (A fast time-resolved infrared spectroscopic investigation into the nature of the lowest excited state and excimer formation in Pt^{II} diamine cyanides.).

Regarding claims 1, 3-12, and 14, Rubner et al. disclose a solid state light-emitting device (OLED) comprising a light-emitting layer between two electrodes (column 3, lines 43-46). The reference discloses the light-emitting layer comprises a metal complex (column 3, line 66 to column 4, line 4, and lines 27-35). The reference also discloses that the metal complex may be a platinum complex and have polypyridine ligands such as phenanthroline (column 8 lines 33-42). The light-emitting layer may consist of metal complex (column 6, lines 5-22) or contain additives (column 5 lines 49-63). The disclosed device can be part of a display device such as a flat-panel display, computer screen or other item that requires illumination (column 1, lines 11-14). However, the reference does not explicitly disclose a complex of instant formulae (II) or (III) as the light-emitting complex.

Kuimova et al. teach light-emitting a complex of instant formula (II) (abstract). The reference teaches the complex of instant formula (II) wherein o is 0, m and n are 1 (unsubstituted phenyl), and R7 and R8 are CN (page 2857, second column). The complex is taught to be emissive in the solid state (page 2858, first column).

It would be obvious to one of ordinary skill in the art at the time of the invention to use the platinum(II) complex of Kuimova et al. in the device of Rubner et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Kuimova et al. teach the complex is luminescent in the solid state and Rubner et al. disclose platinum(II) and polypyridine complexes are both suitable (bipyridine and phenanthroline are both considered to be polypyridine ligands). Further it is well known in the art that photoluminescent complexes will also emit light when an appropriate electrical current is passed through them, $\text{Ru}(\text{bpy})_3^{+2}$ used by Rubner et al. (column 6, line 2) is a well known photoluminescent complex, which would also give one of ordinary skill in the art a reasonable expectation of success. One of ordinary skill would be motivated to try and use the complexes of Kuimova et al. in the device of Rubner et al. by a desire to utilize the light-emitted from the complexes of Kuimova et al.

Regarding claim 2, modified Rubner et al. disclose all the claim limitations as set forth above. Additionally while the reference does not disclose a complex of instant formula (I) the claim does not limit the platinum(II) complex to a complex of instant formula (I). Therefore the claim limitations are met for the reasons set forth above.

12. Claims 1, 2, 4-12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rubner et al. (US 6,548,836 B1) in view of McGarrah et al. (Dyads for photoinduced charge separation based on platinum diamine bis(acetylide) chromophores: synthesis, luminescence and transient absorption studies.).

Regarding claims 1, 4-12, and 15 Rubner et al. disclose a solid state light-emitting device (OLED) comprising a light-emitting layer between two electrodes (column 3, lines 43-46). The reference discloses the light-emitting layer comprises a metal complex (column 3, line 66 to column 4, line 4, and lines 27-35). The reference also discloses that the metal complex may be a platinum complex and have polypyridine ligands such as phenanthroline (column 8 lines 33-42). The light-emitting layer may consist of metal complex (column 6, lines 5-22) or contain additives (column 5 lines 49-63). The disclosed device can be part of a display device such as a flat-panel display, computer screen or other item that requires illumination (column 1, lines 11-14). However, the reference does not explicitly disclose a complex of instant formulae (III) as the light-emitting complex.

McGarrah et al. teach a light-emitting complex of instant formulae (III) (abstract and compound 1, 1-PTZ, and 1-TPZ page 4359). The reference teaches the complex of instant formula (III) wherein p, and q are 1 (t-butyl) and R12 and R13 are acetylide. The complexes are taught to be light-emitting (table 2, page 4361).

It would be obvious to one of ordinary skill in the art at the time of the invention to use the platinum(II) complexes of McGarrah et al. in the device of Rubner et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given

that McGarrah et al. teach the complexes are luminescent in the solid state and Rubner et al. disclose platinum(II) and polypyridine complexes are both suitable (bipyridine and phenanthroline are both considered to be polypyridine ligands). Further it is well known in the art that photoluminescent complexes will also emit light when an appropriate electrical current is passed through them, $\text{Ru}(\text{bpy})_3^{+2}$ used by Rubner et al. (column 6, line 2) is a well known photoluminescent complex, which would also give one of ordinary skill in the art a reasonable expectation of success. One of ordinary skill would be motivated to try and use the complexes of McGarrah et al. in the device of Rubner et al. by a desire to utilize the light-emitted from the complexes of McGarrah et al.

Regarding claim 2, modified Rubner et al. disclose all the claim limitations as set forth above. Additionally while the reference does not disclose a complex of instant formula (I) the claim does not limit the platinum(II) complex to a complex of instant formula (I). Therefore the claim limitations are met for the reasons set forth above.

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rubner et al. (US 6,548,836 B1) in view of McGarrah et al. (Dyads for photoinduced charge separation based on platinum diamine bis(acetylide) chromophores: synthesis, luminescence and transient absorption studies.) as applied to claim 1 above, and further in view of Song et al. (Synthesis and luminescent study of diphosphine-Pt-diacetylide complexes for OLED.) and Miskowski et al. (Electronic spectra and photophysics of platinum(II) complexes with α -diimine ligands. Mixed complexes with halide ligands.).

Regarding claim 3, modified Rubner et al. disclose all the claim limitations as set forth above. However the reference (McGarrah et al.) does not explicitly disclose the complex wherein R12 and R13 are CN.

Song et al. and Miskowski et al. both teach luminescent platinum(II) complexes (abstract of each). The reference teach that using a string-field ligand as the ancillary ligand (R12 and R13) of a platinum(II) complex deactivates non-radiative ligand-field transition (Song page 192, second paragraph of results and discussion; Miskowski page 2523, second paragraph). Cyano and acetylide are both known to be strong-field ligands, therefore one of ordinary skill in the art would reasonably expect cyano and acetylide to be equivalent and interchangeable, both resulting in similar complexes suitable for the same purpose. It would have been obvious to one of ordinary skill in the art to substitute acetylide with cyano and thereby arrive at the present invention. Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

Response to Arguments

14. Applicant's arguments filed 31 July 2009 have been fully considered but they are not persuasive.

Regarding the objection to claim 4, applicants argue that the complexes recited in claim 1 may be of multinuclear form in the solid and/or solution state. The chemical

formula describing complexes (I)-(III), applicant asserts, merely describes the basic chemical formula unit and does not exclude multinuclear complexes, e.g., for example multinuclear complexes that exist transiently in the solution state or as associated structures in the solid state. This argument calls into question the scope of claim 1. The claim positively recites the uncharged platinum(II) complex is selected from the group *consisting of* formulae (I) to (III). These formulae are defined as illustrated in the claim. Applicant appears to argue that the claim also includes other unspecified compounds. However the claim language excludes any compound which does not conform to the expressly drawn structures of formulae (I) to (III) by the recitation of "selected from the group consisting of". Any multinuclear compound formed from complexes of formulae (I) to (III) would possess different or additional bonding than the complexes shown in formulae (I) to (III), thus fail to meet the claim limitation. The presence of additional compounds is not excluded by the claim (OLED comprising uncharged platinum(II) complexes), thus dimmers, excimers or other compounds may be present so long as a compound with chemical formulae (I) to (III) as drawn in the claim is also present. Therefore claim 4 does not further limit claim 1. Arguments regarding the solution phase are not considered relevant because the claims are drawn to an OLED, which is a solid state device.

Regarding the objection to claims 5, 6, 8, and 10 applicants argue that claims 5 and 6 further limit claim 1 because the location of the emitter molecules of claim 1 is not specified while claim 5 explicitly identifies a location of the emitter complexes, i.e., located in a light-emitting layer. However an OLED is a layered electronic device.

Compounds in an OLED will necessarily be in a layer, and any layer comprising the emitter molecules would be considered a light-emitting layer. Claim 5 and 6 do not recite the structure of the device beyond a single layer and therefore fails to distinguish the location of the layer. The light emitting layer as defined in claims 5 and 6 may be anywhere in the device. Claims 8 and 10 also fail to further limit the independent claim. Claims 8 and 10 merely recite an OLED comprising a light-emitting layer. The examiner does not see how an OLED can lack a light-emitting layer and still be an OLED. Further claim 1 recites an OLED while claims 6 and 7, both dependent on claim 1, recite a light-emitting layer (claims 8 and 10 depend from claims 6 and 7, respectively).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

MHW